WOSS 530/6

British Railways Board

Director of Mechanical and Electrical Engineering

Limit Switches

Snaplock 600 Series

WORKSHOP OVERHAUL STANDARD SPECIFICATION

REVISION RECORD

This Specification will be updated when necessary by the issue of the complete document, accompanied by revision letters. The amended or additional part of updated pages will be marked with a vertical black line.

If amendments are considered to be necessary, the following actions shall be undertaken:-

1) Depots using this document as part of a vehicle repair shall complete BR Form 14298 and pass it to the relevant Business Engineer.
2) Contractors shall inform the BRB Director of Procurement in accordance with the contract requirements.

Amendments submitted for consideration shall not be implemented until approved.

Revision No.	Amended Page Nos	Date	Inserted by
0	Original	May 83	
1	RR,1,6,7	Apr 84	
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I authorise the work content of the publication shown above and its distribution to user departments.

Signed:

..... Freight Engineer

..... pp InterCity Maint. Engr.

..... Network SE Engineer

..... Provincial Engineer

..... Parcels Engineer

Should any query arise regarding the contents of this document telephone 0332 42442 Ext. 3516, BR Code is 056 3516, or write to the above address.

TEES/RPL

This Specification applies to equipment fitted to the vehicles indicated 'X' below, but it is only to be implemented when authorised by an appropriate maintenance/overhaul document.

LOCOMOTIVES

03	
08	
09	
20	X
26	
31	X
33	
37	X
43	X
47	X
50	X
56	X
58	X
60	X

73	
81	X
85	X
86	X
87	X
89	
90	
91	
92	

DMU's

101	X
104	X
107	X
108	X
110	X
111	X
114	X
115	X
116	X
117	X
118	X
119	X
120	X
121	X
122	X
128	X

140	
141	
142	X
143	
144	X
150	X
151	
154	
155	X
156	X
158	

EMU's

302	
303	X
304	
305	
307	
308	
309	X
310	X
311	X
312	
313	X
314	X
315	
317	
318	X
319	
320	X
321	X
322	X
504	
507	
508	

411	
412	
413	
414	
415	
416	
419	
421	
422	
423	
431	
438	
442	X
455	
456	
485	
486	
487	
488	
489	

COACHING STOCK

Mk 1	
Mk 1 Catering	
Mk 2z, 2a-c	
Mk 2d-e	
Mk 2f	
Mk 2f DBSO	X
Mk 3a	X
Mk 3b	X
Mk 3 Catering	X
Mk 3(HST)	X
Mk 3(HST)Catering	X
Mk 3 SLE and SLEP	X
Mk 4	
DVT IC225	
DVT IC125	
Non Passenger	

DEMU's

204	
205	
207	

WAGONS

COMPONENTS

WOSS 530/6

WORKSHOP OVERHAUL STANDARD SPECIFICATION 530/6

LIMIT SWITCHES

Snaplock 600 Series

CONTENTS

REFERENCE DOCUMENTS

BR Drg. Nos.	L-A0-3507	Arrangement of Deadman's Pedal & Sanding Valve.
	L-A0-11042	Arrangement of Parking Brake Interlock.
	L-A0-11043	Parking Brake Interlock Details.
	A1-A0-8500066	Installation of Brake Limit Switch [DBSO].
	B2-A1-9010295	Arrangement for Foot Operated DSD and/or Vigilance Assy.
	B2-A1-9016509	Acme Snaplock DSD Pedal Limit Switch
WOSS 560/4	Crimped Joints for Cables.	

TOOLS AND MATERIALS	BR Cat No.
Loctite 222	007/060355

SECTION 1 REPAIR PROCEDURE

NOTE:
Where an item is first mentioned in the text it is followed by a number in brackets. The first part of the number, before the full stop, refers to the figure on which the item is identified. The second part of the number, after the full stop, is the number of the item as it appears on the figure. Items lists associated with figures use the full number. If an item is identified on more than one figure then the items list for each figure will give the alternative number.

1. Dismantling

1.1 Classes 101-128

1.1.1 Slacken the pipe plug (4.13). Remove the six screws (3.3, 4.4) and switch and plug assembly (3.16, 4.18) from the mounting plate (3.12, 4.10).

1.1.2 Slacken the pipe plug (3.6, 4.9) and remove the pointer.

1.1.3 Slacken the pipe plug in the lever shaft (3.5, 4.14).

1.1.4 Remove special locknut, locknut and shakeproof washer (3.7, 4.11).

1.1.5 Remove splitpins from the pivot pins (3.10, 3.11, 4.3, 4.6) and dismantle operating levers (3.1, 3.4, 4.5, 4.7) and connecting link (3.2, 4.2). Discard pivot pins and splitpins.

1.2 Remove the front cover (1.26) and front insulator (1.23). Discard either if fractured.

1.3 Classes other than 101-128: remove the back cover (1.6) and discard the gasket.

1.4 Remove the cap nut (1.27) and the contact arm assembly (1.25).

2. Cleaning, Examination and Repair

2.1 Clean all components with a dry cloth. It may be necessary to use solvent and a bristle brush and dry if the switch is contaminated with oil. Renew the shaft O rings (1.15) if oil has entered the switch.

2.2 Renew the contact block assembly (1.2) if it is fractured or if any of the fixed contacts (1.21) are eroded. Ensure the contact block fixing screws (1.4) are tight.

2.3 Renew the arc shield (1.22) if it is fractured or burnt.

2.4 Renew the contact arm assembly (1.25) if any of the contacts are eroded or if the contact springs are burnt or weakened.

2.5. Renew the overtravel spring (2.6) if it is fractured or deformed.

2.6 Check that both latches (2.8) move freely. If any is stiff it is to be removed from its pivot and the pivot and hole cleaned.

2.7 Renew missing or distorted latch retaining clips (2.1).

2.8 Renew any latch return spring (2.2) which does not hold its latch against the rocker (2.9).

2.9 Classes other than 101-128: remove and examine the lever return spring (2.7). Renew the spring if it is fractured, distorted or does not have a free length of 24-26 mm.

N.B. For DSD applications this spring is not supplied by the switch manufacturer - see Section 3, Table 2.

2.10 Classes other than 87 Vigilance: ensure that the conduit inlet thread is serviceable.

2.11 Ensure the rocker (2.9) is secured to the spindle (1.8) with a spring dowel (1.7). Renew any worn component.

2.12 Renew the lever shaft (1.13) if the splines or threads are damaged.

2.13 Renew the lever shaft bush if worn.

2.14 Examine the lever (2.5). Renew if damaged or if the roller is worn.

2.15 Classes 101-128: temporarily fit the pointer to use as an operating lever.

2.16 Move the switch to the overtravel position in each direction and ensure that the spring dowel (1.12), lever shaft (1.13) and lever (2.5) are secure. Renew any defective components.

2.17 Check the lever shaft for freedom of movement. If it is stiff the assembly is to be dismantled, cleaned and defective parts renewed.

2.18 Fit the contact arm assembly and the cap nut.

2.19 Operate the switch in both directions and ensure the latches engage correctly. Check that the moving contacts cannot be separated from the fixed contacts by moving the contact arm. If the contacts can be separated, renew the worn latch or rocker.

2.20 Check the roller slide assembly (1.9, 2.4) for correct operation. (There are several variations in the design of this assembly). Renew any worn parts.

2.21 Ensure that the backs of the latches and the associated parts of the switch housing (1.35) are dry and clean to prevent adhesion.

2.22 Classes 101-128.

2.22.1 Examine the plug. Renew the adaptor if the thread is defective. Renew the plug if the housing is fractured or if the pins are damaged. Ensure the socket is tightly secured to the switch with lockwasher fitted with an allen screw in the body.

2.22.2 Check and tighten terminal connections. Reterminate in accordance with WOSS 560/4 if defective. Ensure that the plug is connected to the switch as shown in Figure 1.

2.22.3 Renew any mounting plate (3.12, 4.10), operating lever (3.1, 3.4, 4.5, 4.7), connecting link (3.2, 4.2) and eccentric adjustment pin (3.9, 4.12) which is bent or damaged.

2.22.4 Reassemble the mounting plate, operating levers, connecting link, and eccentric adjusting pin. Renew any missing parts. Ensure both pivot pins are fitted with split pins.

2.22.5 If the switch was previously fitted to the mounting plate with centre-punched screws, re-drill the mounting plate countersinks to remove burrs.

2.22.6 Apply oil to the pivot pin lubrication holes. Ensure the lever mechanism moves freely.

2.22.7 Release the locknuts (3.7, 4.11), set the eccentric pivot to its lowest position and tighten the locknuts (see Figure 3).

3 Reassembly

3.1 Renew any spring washers, shakeproof washers, or splitpins which have been disturbed. Use new items for those discarded.

3.2 Classes other than 101-128: fit the lever return spring. Ensure that this causes the mechanism to return to its normal position.

3.3 Fit the pointer, ensuring that it is positioned centrally when the contact arm assembly is in the neutral (mid) position.

3.4 Fit the front insulator and front cover.

3.5 Classes 101-128.

3.5.1 Fit the lever shaft (3.5, 4.14) to the operating lever (3.4, 4.5) so that the operating arms are parallel with the edge of the mounting plate with the switch in the following position.

Final drive types F239/280 (Figure 3: classes 101-110, 116-122, 131).

Pointer in L.H. position viewed from switch front. Alternatively, set the operating lever to the dimensions given on Figure 3.

Final drive type RF28 (Figure 4: classes 111, 114, 115, 123-128).

Pointer in neutral (mid) position.

3.5.3 Fit the switch to the mounting plate using Loctite 222 on the screws (3.3, 4.4).

3.6 Classes other than 101-128: fit the back cover and gasket.

Items List for Figure 1

Item	Description	Sigma Part No.	BR Cat No.
1.1	Screw	375211	090/010504
1.2	Contact block assembly	375001	015/094403
1.3	Screw 8-32 x 1/2" pan	375321	015/009007
1.4	Screw 6.32 x 1/2"	375322	014/001258
	Washer no.6	375332	090/010496
1.5	Gasket	375208	090/010449
1.6	Back cover:		
	for side mounted switch	375259	090/010497
	for back mounted switch	375261	
	Orange - for back mounted switch	375897	
	Gasket	373024	015/084054
1.7	Spring dowel 3/32" x 7/16"	375327	015/084063
1.8	Spindle	375003	015/084084
1.9	Roller slide assembly	375227 & 228	090/010510
1.10	Roller slide spring	375230	015/084077
1.11	Overtravel lever	375202	090/010500
1.12	Spring dowel 3/32" x 3/4"	375203	015/084064
1.13	Lever shaft assembly	373083	015/084074
	Lever shaft	375201	090/010499
	Bush, lever shaft	373042	015/084051
1.14	Screw 8-32 x 1/2" csk	375320	015/009008
1.15	O ring	232226	010/048283
1.16	Operating lever	See Table 3	
1.17	Roller	See Table 3	
1.18	Roller shaft		
1.19	Plug, 1/8" BSP taper	375326	015/084069
1.20	Moving contact		
1.21	Fixed contact		
1.22	Arc shield	375233	015/094402
1.23	Front insulator	375234	090/010501
1.24	Circlip	375305	090/010503
1.25	Contact arm assembly	375064	015/084085
1.26	Front cover	375316	090/010502
1.27	Cap nut	375264	015/084087
1.28	Front cover gasket	375206	015/084055
	Service kit (1.2, 1.4, 1.25, 1.27)	540300	015/084057

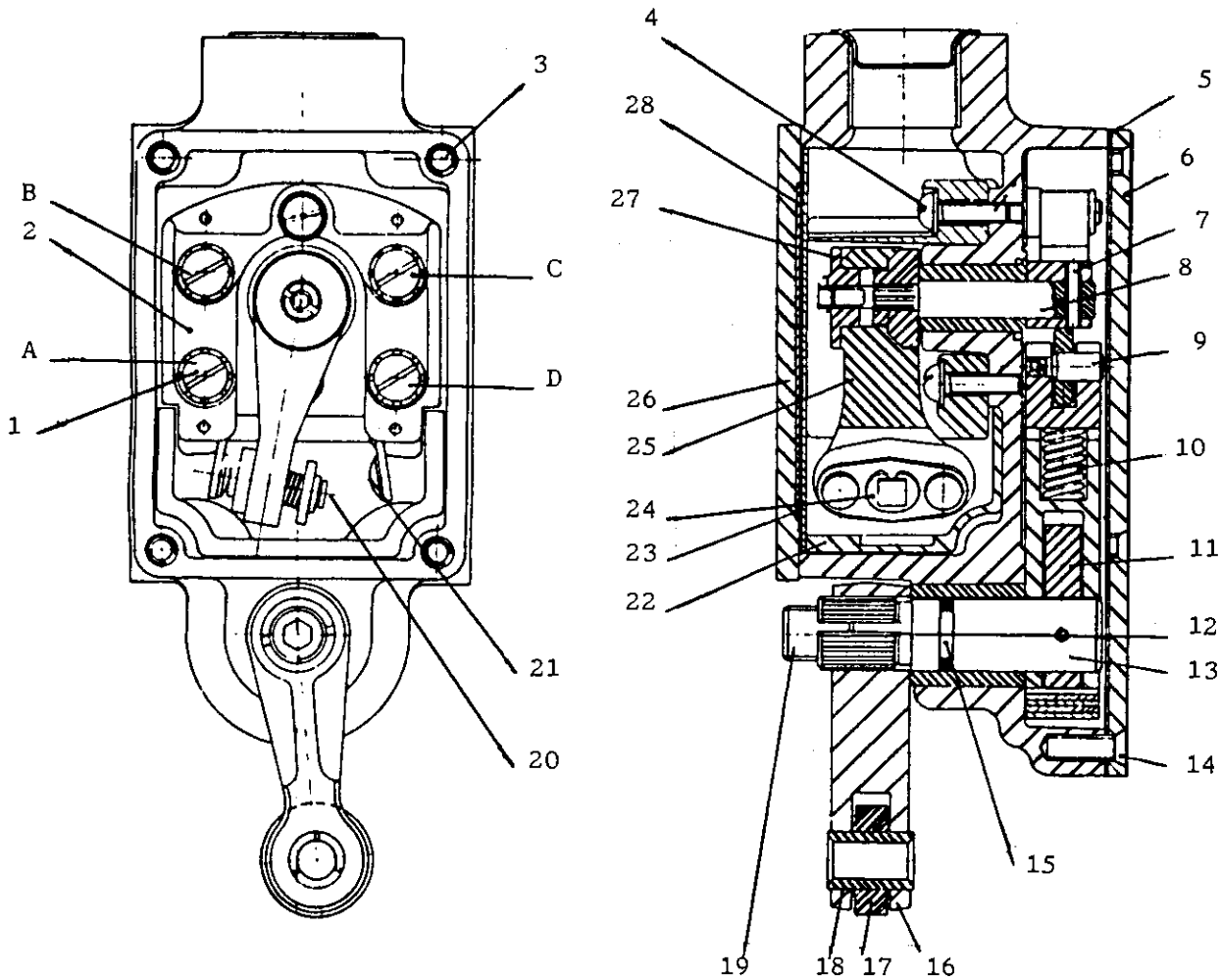


Figure 1 Front and Side Views

Items List for Figure 2

Item	Description	Sigma Part No.	BR Cat No.
2.1	Clip, return latch retaining	233171	090/010507
2.2	Latch return spring	375232	015/084075
2.3	Switch housing	375004	
2.4	Roller slide assembly	375227 & 228	
	Nylon block (neutral)	375263	015/084050
2.5	Lever	375200	090/010506
2.6	Overtravel spring	375204	015/084076
2.7	Lever return spring (flip-flop)	375231	090/010505
	Lever return spring (neutral)	375067	
2.8	Latch (flip-flop)	375224	090/010509
	Latch (neutral)	575225	
2.9	Rocker (flip-flop)	375226	090/010508
	Rocker (neutral)	375269	

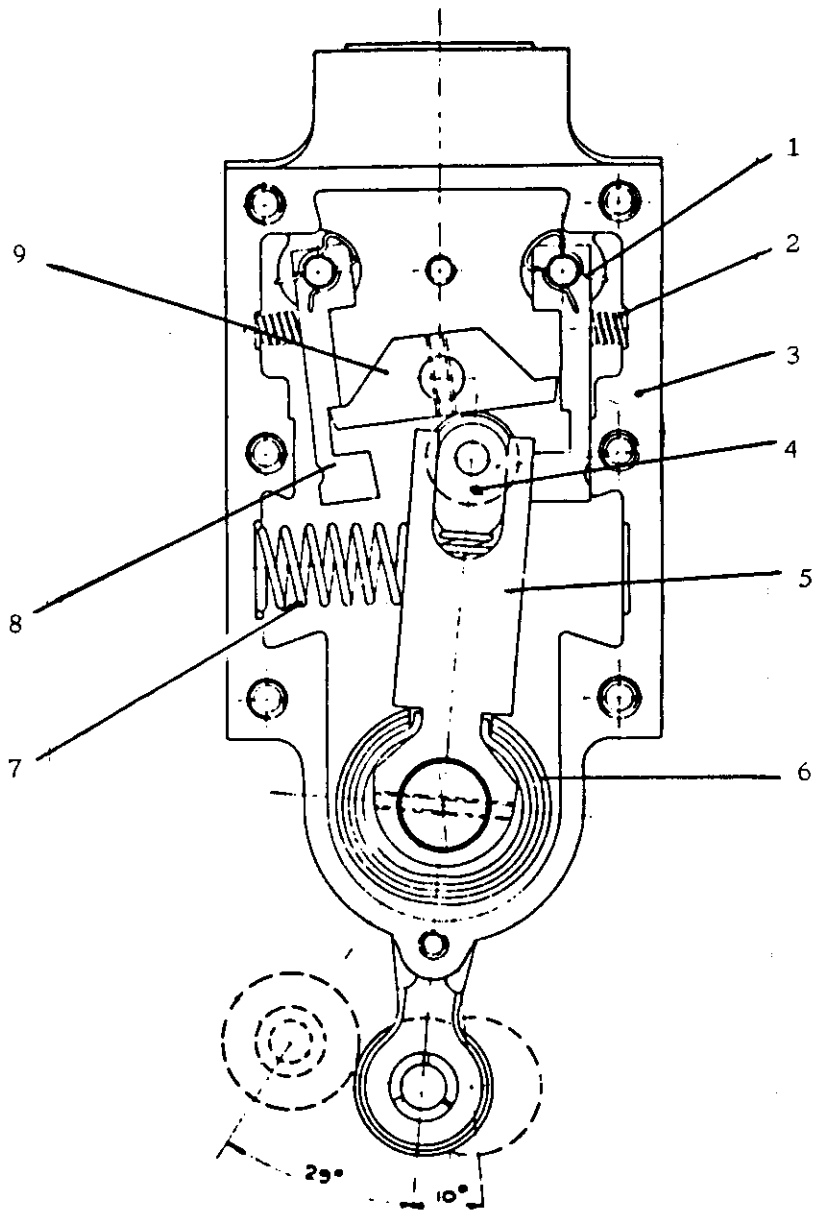
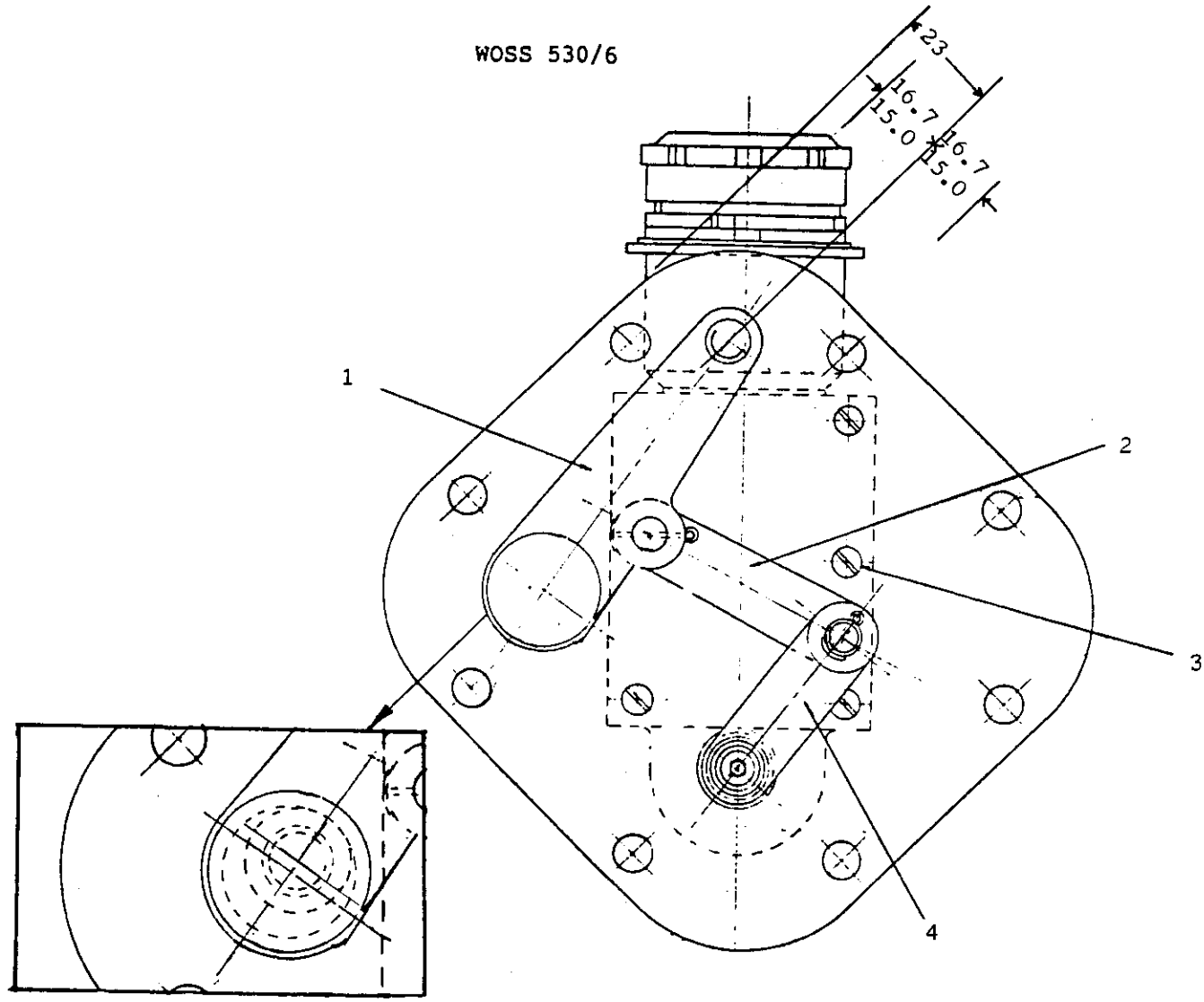


Figure 2 Back View

Items List for Figure 3

Item	Description	Sigma Part No.	BR Cat No.
3.0	Complete assembly	FA-0903	015/011229
	Assembly less switch & plug	FA-0903/PL	015/094413
3.1	Operating lever assembly	373023	015/011428
	Lever	373001	
	Pivot pin	373010	
	Roll pin	373017	
3.2	Connecting link	373013	
3.3	Screw 2BA x 9/16" csk	240239	
3.4	Operating lever	373020	015/084059
3.5	Lever shaft complete	373039	015/084001
	Pointer	373000	015/084070
3.6	Pipe plug 1/8" taper	375722	015/084069
3.7	Special lock nut	373022	015/084062
	Locknut 3/8" BSF 20 tpi		
	Shakeproof washer 3/8 E.T.		
3.8	Bush for lever shaft	373042	015/084051
3.9	Eccentric adjusting pin	373007	
3.10	Pivot pin (drilled end)	373009	015/084067
	Splitpin		
3.11	Pivot pin (drilled centre)	373008	015/084066
	Splitpin		
3.12	Mounting plate with bush	373019	
3.13	Back cover gasket	373024	015/084054
3.14	Groverlock pin 3/32" x 3/4"	375203	015/084064
3.15	O ring	232226	015/084072
3.16	Switch & plug assembly	373075	015/004078
	Plug assembly	373077	015/084068
	Plug housing	373030	
	Interior and wiring assembly	373118	
	Grub screw	131680	
	Adaptor, large thread	373026	015/094388
	Ring	373027	015/094387
	Washer	373021	
	Lockwasher	373028	015/034218
	Locknut	373022	015/084062
	Locking ring	373029	015/094398
	Protective cap	373038	015/084053



Setting of Eccentric Adjustment Pin

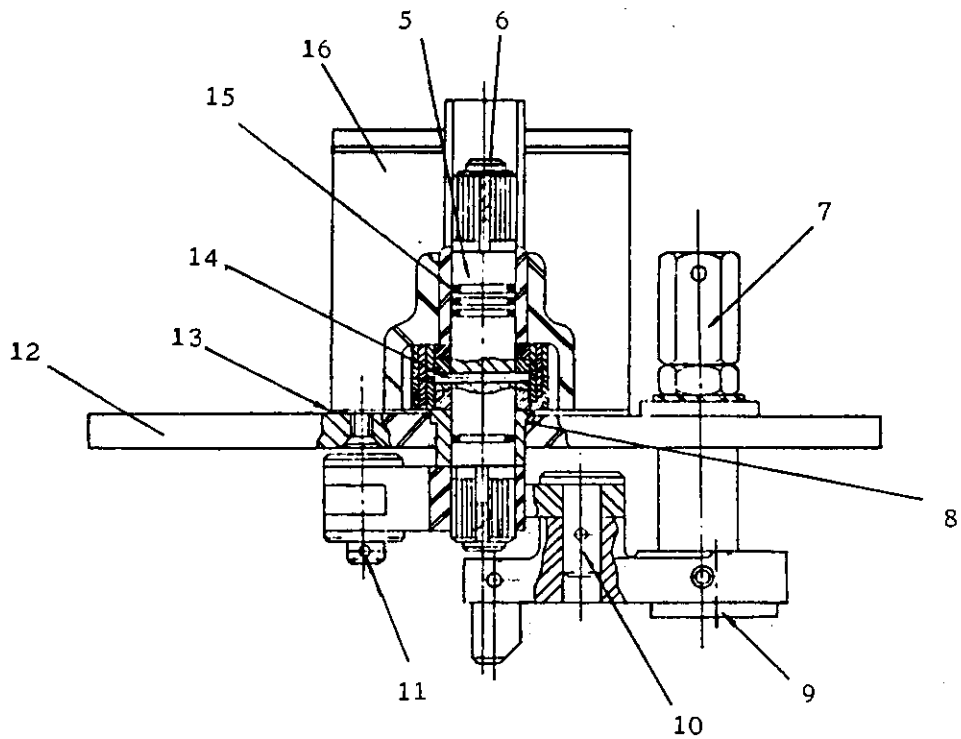


Figure 3. Indicator Switch for F239/280 Final Drives

Items List for Figure 4

Item	Description	Sigma Part No.	BR Cat No.
4.0	Complete assembly	FA-0903/SCG	015/011228
4.0	Assembly less switch & plug	FA-0903/SCG/PL	015/094412
4.1	Screw 5/16" BSF x 5/8" hex	240153	
4.2	Connecting link	373013	
4.3	Pivot pin (drilled end)	373009	015/084067
4.4	Screw 2BA x 9/16" csk	240239	
4.5	Operating lever	373005	015/084059
4.6	Pivot pin (drilled centre)	373008	015/084066
4.7	Operating lever	373004	
	Lever	373002	
	Pivot pin	373010	
	Roll pin	373017	
4.8	O ring	232226	015/084072
4.9	Pipe plug 1/8" taper	375722	015/084069
4.10	Mounting plate with bush	373003	015/094407
4.11	Special lock nut	373022	015/084062
4.12	Eccentric adjusting pin	373007	
4.13	Pipe plug 1/8"taper	375722	015/084069
4.14	Lever shaft complete	373039	015/084001
	Pointer	373000	015/084070
4.15	Bush for lever shaft	373042	015/084051
4.16	Back cover gasket	373024	015/084054
4.17	Groverlock pin 3/32" x 3/4"	375203	015/084064
4.18	Switch & plug assembly	373075	015/004078
	Plug assembly	373077	015/084068
	Plug housing	373030	
	Interior and wiring assembly	373118	
	Grub screw	131680	
	Adaptor, large thread	373026	015/094388
	Ring	373027	015/094387
	Washer	373021	
	Lockwasher	373028	015/034218
	Locknut	373022	015/084062
	Locking ring	373029	015/094398
	Protective cap	373038	015/084053

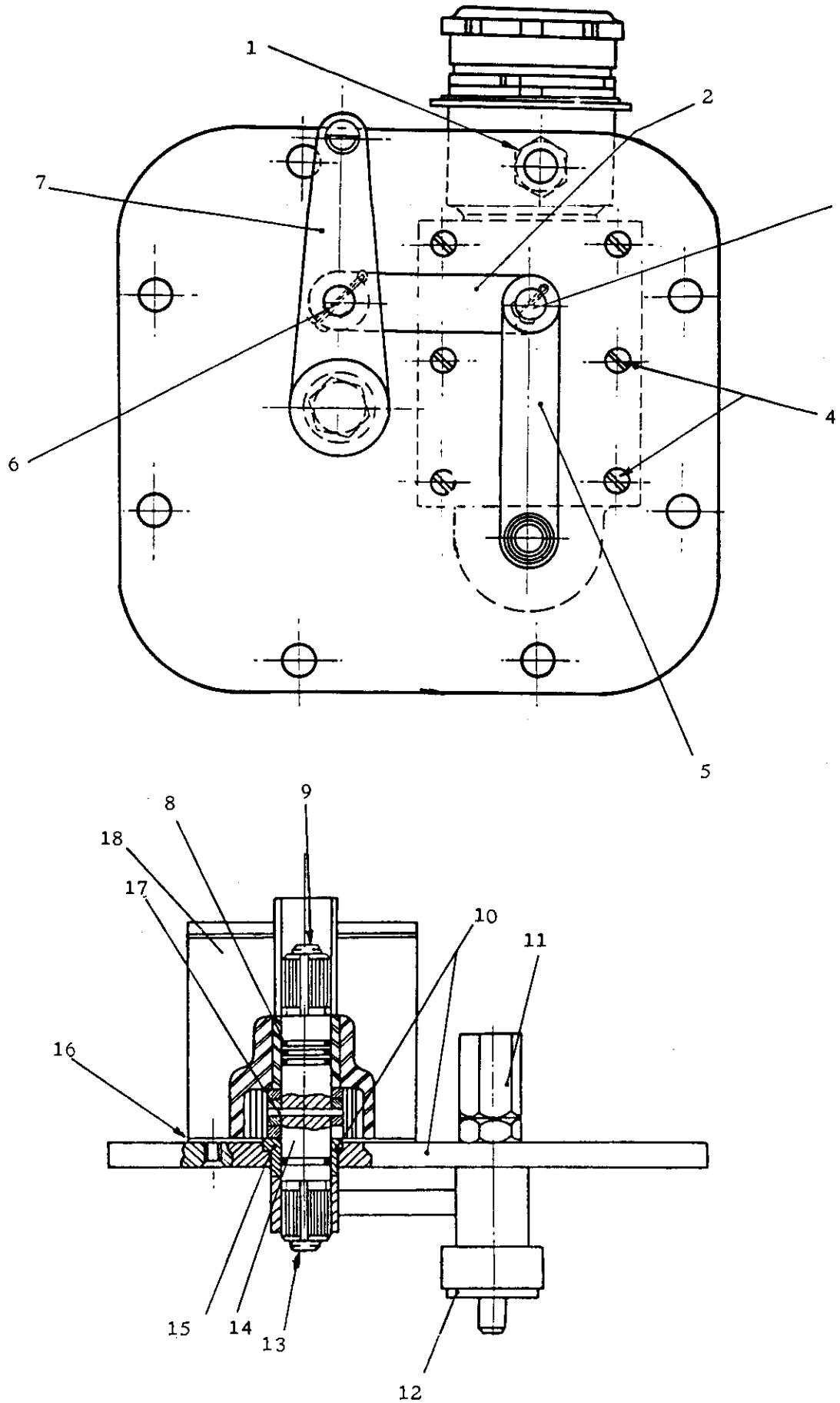


Figure 4. Indicator Switch for RF28 Final Drives

Items List for Figure 5

Item	Description	Sigma Part No.	BR Cat No.
5.1	Switch mounting plate C1/7/1192.02		
5.2	Screw M5 x 20 hex		035/100402
	Lockwasher M5		003/195006
	Washer M5		003/190822
5.3	Screw self tap no.8 x 5/8"		035/055874
5.4	Conduit locknut M20		054/134312
5.5	Seat shell joint moulding		010/055525
5.6	Switch, snaplock with style 1 backplate	560046	093/070902
5.7	Lever	540122	093/070903
*5.8	Knee hole back C1/7/1201		
5.9	Conduit nipple M20		054/132232
5.10	Conduit bush M20 female		054/131102
5.11	Conduit locknut M20		054/134312
5.12	Screw M5 x 20 hex		035/100402
	Lockwasher M5		003/195006
	Washer M5		003/190822
	Nut M5		003/175110

* Item 5.8
Drawing C1/7/1201 shows modifications required to Knee Hole Back to enable Snaplock switch unit to be fitted.

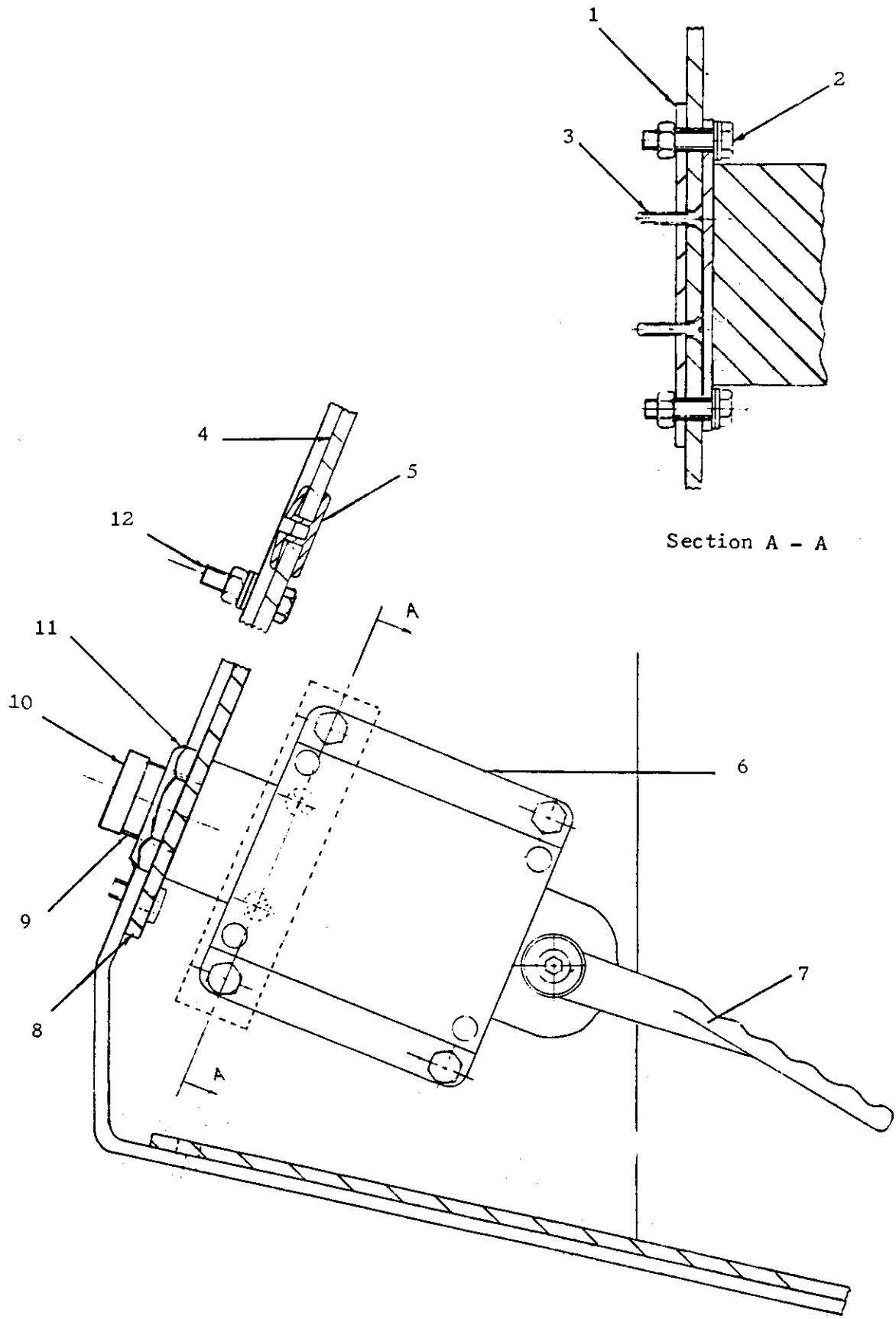


Figure 5. DSD Pedal Arrangement BR Cat No. 093/070901

SECTION 3 TECHNICAL DATA

Table 1 Vehicle Classes, Switches and Levers

Class	Application	Sigma Part Nos		BR Cat No (switch + lever)
		Switch	Lever	
20 31	DSD/Vigilance Pedal	471161	540014	072/006877
43	DSD/Vigilance Pedal	471161	540016	090/004263
37 47	DSD/Vigilance Pedal	471161	540014	072/006877
47/7	Handbrake Indicator	560082SR	540020	061/029656
50	DSD/Vigilance Pedal	471161	540014	072/006877
56	DSD/Vigilance Pedal	471161	540016	090/004263
58	DSD/Vigilance Pedal	471161	540014	072/006877
60	DSD/Vigilance Pedal	471161	540014	072/006877
81-85	Handbrake Ind.	560082	540020	
86	Handbrake Ind.	560010	540016	090/004263
87	DSD/Vigilance Pedal	560010 (less conduit entry)	540016	090/004263
101-111 116-127	Direction Indicator	See Figure 3		
114 115 128	Direction Indicator	See Figure 4		
142 144 150 155 156 DBSO 9701-10	DSD/Vigilance Pedal	471161	540014	072/006877

TABLE 1 (Continued.)

Class	Application	Sigma Part Nos		BR Cat No (switch + lever)
		Switch	Lever	
303	Handbrake Indicator	560337	540001	093/070482
	DSD Pedal (Figure 5)	560046	540122	093/070901
309	Vestibule Lighting	560010	540000	054/087883
310	Handbrake Ind.	560010	540016	090/004263
311	Handbrake Ind.	560337	540001	093/070482
313 314	DSD Pedal (Figure 5)	560046	540122	093/070901
318	DSD/Vigilance Pedal	471161	540014	072/006877
320	DSD/Vigilance Pedal	471161	540014	072/006877
321	DSD/Vigilance Pedal	471161	540014	072/006877
322	DSD/Vigilance Pedal	471161	540014	072/006877
442	DSD/Vigilance Pedal	471161	540014	072/006877
DBSO 9711-13	DSD/Vigilance Pedal	471161	540014	072/006877
	Handbrake Indicator	560010SR	540011	052/004034
Mk 3	Lighting Controller	471013	372576	

Table 2 Switch Variations

Switch Part No	BR Cat No	Variations
373075	015/004078	Supplied with plug assembly. No back plate fitted. Pointer fitted to front of lever shaft. Lever shaft extended for rear operation.
471013	064/000848	Neutral position. 2 screw side mounting.
560010	014/000679	2-screw side mounting. Return spring fitted (2.7) for clockwise operation.
560010SR		As 560010 but return spring fitted for anticlockwise operation.
560046	093/070902	As 560010 but type 1 backplate. (see Figure 5).
471161	015/079280	As 560082 but return spring (2.7) changed for a spring to BR Cat No. 072/006876 for DSD application: see B2-A1-9016509. Lever 540014.
471014		As 560010 but return spring (2.7) changed for a spring to BR Cat No. 072/006876 for DSD application: see B2-A1-9016509. Orange backplate. Lever 540014.
560082	090/009772	Back-mounting backplate. Return spring fitted (2.7) for clockwise operation.
560337	054/086696	2 off 560010 mounted back-to-back with interconnecting lever shaft.

Table 3 Lever Variations

Lever Part No	BR Cat No	Length Between Centres (mm)	Roller Diameter (mm)
540000	054/039095	38.1	19.5
540001		38.1	31.7
540011		31.7	19.0
540014	052/003484	41.3	31.7
540016	090/008414	50.8	19.0
540020	015/084059	63.5	19.0
540122	093/070903	Foot pedal	
372576	064/000849	Carriage key adaptor	